Elementary STEM Discipline Connections to Framework, Processes and Practices

New Science Framework
Mastery of Science Content, Concepts and Dimensions 1-3 Pre-KS thru 5th
http://www.nap.edu/catalog.php?record_id=13165

Dimension 1
Scientific and Engineering Practices
1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Dimension 2
Crosscutting Concepts Crosscutting Concepts
1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

Dimension 3
Disciplinary Core Ideas
Physical Sciences
Life Sciences
Earth and Space Sciences
Engineering, Technology, and the Applications of Science
ETS 1: Engineering design
ETS 2: Links among engineering, technology, science, and society

ITEEA
Listing of Standards for technological Literacy K-5th Grades
http://www.iteaconnect.org

The Nature of Technology

Technology and Society

Design

Abilities for a Technological World

The Designed World

Maryland Technology Literacy Standards for Students
http://marylandpublicschools.org/NR/rdonlyres/CFAE6DE8-94E4-4D72A1DE-50061B2B2A05/13089/MTLSSComplete1.pdf

1.0 Technology Systems

2.0 Digital Citizenship

3.0 Technology for Learning and Collaboration

4.0 Technology for Communication and Expression

5.0 Technology for Information

6.0 Technology for Problem-Solving and Decision-Making

Engineering Design Process for Elementary

The Engineering Design Process is cyclical and can begin at any step, or move back and forth between steps numerous times.
http://www.iteea.org/TAA/PDFs/xstnd.pdf

Technology Process Tool

Technology is everything that is human-made or human-altered. It is how humans have modified the natural world to meet their needs and wants.

Children's Engineering Educators, LLC 2009.

Ask a question/ See Problems

Imagine / Brainstorm

Create Solutions

Plan / Test Solutions

Improve / Evaluate Solutions

Maryland Common Core Mathematical Practices
http://mdk12.org/instruction/curriculum/mathematics/index.html

1. Making sense of problems and persevere in solving them

2. Reason abstractly and quantitatively

3. Construct viable arguments and critique the reasoning of others

4. Model with mathematics

5. Use appropriate tools strategically

6. Attend to precision

7. Look for and make use of structure

8. Look for and express regularity in repeated reasoning